present after the reaction with the analyte indicates that there was a large quantity of analyte present in the sample of material.

[0033] In the exemplary embodiment of the present invention, first, second, third, and fourth housing segments are disposed about a central housing segment. For clarity of description, the four housing segments are numbered in a clockwise direction. The exemplary apparatus is shown in FIG. **1**. A valve is positioned to open or close off different flow paths through the central housing segment. The valve includes two positions: 1) a sample preparation position (e.g., valve **14** shown in FIG. **4**A), where the valve is positioned to fluidically connect a first housing segment including a sample of material with a third housing segment, which retains "waste", and 2) a testing position (e.g., valve **14** shown in FIG. **4**B), where the valve is positioned to fluidically connect a fourth housing segment that includes a buffer solution with a second housing segment, which includes a testing device adapted to detect the analyte and provide a visual indicium of the presence or absence of the analyte.

[0034] Any suitable number of housing segments may be used in alternate embodiments. The number of housing segments may depend on, for example, the type of assay chemistry used. Those skilled in the art may modify the exemplary invention in order to adapt the present invention to a different type of assay.

[0035] FIG. **1** is a perspective view of an exemplary embodiment of apparatus **10** of the present invention, which includes frame **12**, rotary valve **14** (with handle **14**A), central housing segment **15** (shown in FIG. **3**), first housing segment **16** (with extension tube **16**A), second housing segment **18**, third housing segment **20**, and fourth housing segment **22**. Frame **12** is a rigid material, such as cardboard, plastic, metal foil, or a combination of the same. In some embodiments, frame **12** may include a protective coating in order to help frame **12** resist fluids and to help protect frame **12** from damage due to exposure to fluids (e.g., water damage). Valve **14** is a rotary valve that includes a seal selector to selectively seal off pathways **17**, **19**, **21**, and **23** (shown in FIG. **3**) between central housing segment **15** and each of the housing segments **16**, **18**, **20**, and **22**, respectively. However, any suitable valve may be substituted for valve **14** in alternate embodiments.

[0036] First, second, third, and fourth housing segments **16**, **18**, **20**, and **22**, respectively, are disposed about central housing segment **15** and are in selective fluidic communication therewith. Specifically, valve **14** may be actuated in order to selectively fluidically connect two or more housing segments **15**, **16**, **18**, **20**, and **22**. The capability of valve **14** to adjust flow paths through central housing segment **15** enables an operator to control when different fluids (e.g., buffers) contained within one or more housing segments **15**, **16**, and/or **22** are released, which may allow the operator to control when the assay is run and to control reaction times. This will be described in greater detail below.

[0037] In the exemplary embodiment, housing segments **15**, **16**, **18**, **20**, and **22**, are formed of a single piece of a flexible film, such as a plastic film, that is attached to one side of frame **12** using any suitable method, such as a pressure sensitive adhesive. As a result of this construction, apparatus **10** has a relatively low profile (e.g., less than 2.5 centimeters thick). Preferably, the film and frame **12** are attached so as to form a leak proof assembly. Housing segments **15**, **16**, **18**, **20**, and **22** may be formed by any suitable method, including vacuum forming a sheet of flexible film to form a plurality of blister-like housing segments and by attaching the flexible film to frame **12**.

[0038] A general description of each housing segment will be followed by a detailed description of each housing segment and the operation of apparatus **10**. Central housing segment **15** includes capture medium **24** (shown in phantom in FIG. **3**), which is adapted to capture analyte from a sample of material. First housing segment **16** is configured to receive sample acquisition assembly **3**, which preferably includes sample acquisition device **5** including porous medium **6**, hollow shaft **7** (with first end **7**A and second end **7**B), and first fluid reservoir **8** in selective fluidic communication with hollow shaft **7**. First fluid reservoir **8** retains first fluid **9**. Second housing segment **18** includes a testing device adapted to detect presence of the analyte. Third housing segment **20** is configured to retain at least a substantial amount of a first fluid that after it is released from the first fluid reservoir. Fourth housing segment **22** includes a second fluid reservoir, which includes second fluid **25**.

[0039] Valve **14** may be actuated between a sample preparation position and a testing position. For example, an operator may grasp handle **14**A (with a tool, manually, or otherwise) to rotate valve **14**. As FIG. **3** will show, without valve **14**, each housing segment **15**, **16**, **18**, **20**, and **22** is fluidically connected to each other. Valve **14** is configured to selectively close off specific housing segments **16**, **18**, **20**, and **22**. Otherwise stated, depending on its rotation position relative to frame **12**, valve **14** is configured to selectively close off specific pathways **17**, **19**, **21**, and **23** between each housing segment **16**, **18**, **20**, and **22**, respectively, and central housing segment **15**.

[0040] FIGS. **2**A-**2**C illustrate an exemplary embodiment of valve **14** and how the seal selector feature of valve **14** opens and closes different pathways. FIG. **2**A is a cross-section of an exemplary open pathway **2**, which is representative of pathway **17**, **19**, **21**, or **23**. Pathway **2** is formed between frame **12** and flexible material **13**, which forms each housing segment **15**, **16**, **18**, **20**, and **22**. The cross-section shown in FIG. **2**A is representative of a cross-section taken along line A-A in FIG. **1**.

[0041] FIGS. **2**B illustrates how rib **4** of valve **14** may be used to close pathway **2**. Valve **14** may include a plurality of ribs, where each rib corresponds to a pathway **17**, **19**, **21**, and **23**. Valve **14** may be actuated to rotate rib **4** in and out of position (where in the "in position", rib **4** is positioned within a notch **2***a* formed by pathway **2** in frame **12**) in order to close and open pathway **2**. Valve **14** is biased toward frame **12** by suitable bias means, such as a spring. Rib **4** is configured to fit within notch formed by pathway **2** as valve **14** is actuated and rib **4** passes over pathway **2**. In this way, rib **4** acts as a detent for valve **14**. As rib **4** fits within notch **2***a*, tactile and/or audible feedback is supplied to an operator that valve **14** is in a correct position. The detent also helps prevent accidental movement of valve **14**, such as during shipping, storage, or during operation of apparatus **10**. As seen in FIG. **3**, flexible material **13** folds back on itself when rib **4** is positioned over pathway **2**. It is preferred that flexible material **13** that forms each housing segment and pathway of apparatus **10** does not pinch or wrinkle as rib **4** slides into notch **2***a*.

[0042] FIG. **2**C illustrates how valve **14** may be used to control a flow rate through pathway **2** by actuating rib **4** only partially over pathway **2** (shown in FIG. **2**A) to form partially open pathway **102**. Pathway **102** is smaller in cross-section